UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

DATE: MAR 2 7 2015

SUBJECT: Removal Site Evaluation for the Columbia Smelting & Refining Works Site, 98 Lorraine Street, Brooklyn, Kings County, New York 11231 (CERCLIS ID NYN000206593)

FROM: Margaret Gregor, On-Scene Coordinator
Removal Action Branch

TO: Joseph Rotola, Chief
Removal Action Branch

Introduction

The United States Environmental Protection Agency (EPA) Region II Removal Action Branch (RAB) has been requested to conduct a Removal Site Evaluation (RSE) at the Columbia Smelting & Refining Works Site (Site) by the EPA Special Projects Branch (SPB) Pre-remedial Section. The EPA SPB Pre-remedial Section screened the Site in spring 2014 and, as of May 28, 2014, maintains a "SI Ongoing" Status for the Site, meaning a Site Investigation is underway.

The Site was included on a list of hundreds of locations nationwide where secondary lead smelting or alloying may have been conducted between 1931 and 1964, according to entries in historical trade publications. The list was originally compiled by William P. Eckel in a doctoral dissertation for George Mason University, and the research was summarized in the article entitled, "Discovering Unrecognized Lead-Smelting Sites by Historical Methods" (Eckel et al, 2001). In total, 89 of the sites on this list are in New York State. The New York State Department of Environmental Conservation (NYSDEC) assessed the majority of the sites and ultimately referred 40 of these sites to EPA for further assessment.

Site Description and Background

The Site property is the location of a former secondary smelter which was at 98 Lorraine Street (addressed as 98 to 138 Lorraine Street) in the Red Hook neighborhood of Brooklyn, Kings County, New York, in what is now a mixed recreational, residential, commercial and industrial area. The former smelter was located in the northwest portion of a 4.17-acre city block (Block 581, Lot 1) developed with four baseball/softball fields (field numbers 5, 6, 7 and 8) and two cricket courts as part of Red Hook Park. This block is designated as Zone 4 of the park. Red Hook Park, which is owned by the New York City Department of Parks and Recreation (NYC Parks), totals approximately 58 acres. The footprint of the former smelter facility building is currently developed with a baseball/softball field (Ball Field #7) and associated fencing, benches, bleachers, walkways, landscaping and a water fountain, as well as the Lorraine Street/Hicks Street Metropolitan Transportation Authority bus stop. Bare soil is present in the vegetated and partially grass-covered areas, including areas adjacent to bleachers, as well as the infield.

The block where the historic smelter was located is bordered by Lorraine, Henry, Bay and Hicks Streets to the north, east, south and west, respectively. The Site is surrounded by a large residential public housing complex (Red Hook East Houses) to the north, a community pool (Red Hook Pool) within Red Hook Park to the east, the remainder of Red Hook Park and associated recreational areas to the south, and residences as well as a condemned former industrial plant (a food and cosmetic dye manufacturer) to the west. A daycare center (Bumble Bee Daycare) is present among the residences to the west, and several playgrounds are present within the residential complex to the north. Exposed soil is present throughout grassy areas of the surrounding properties, especially throughout the housing complex and park areas. Available wind rose charts indicate that the prevailing winds in the vicinity of the Site are predominately to the southeast, with limited components to the north and southwest.

According to historical sources, a portion of the Site was occupied by smelting and refining companies from the late 1920s through the late 1930s, including Delevan Smelting & Refining Co. in the late 1920s and Columbia Smelting & Refining Works (Columbia) from at least 1931 through the late 1930s. Columbia was established in 1888, but it may have been originally located 365-367 West Street and/or 62 or 307 Water Street in Manhattan. The Site property was undeveloped prior to the mid-1920s. The Site was developed with a single-story, approximately 14,000-square foot building from the mid- to late 1920s until the late 1930s; it was demolished prior to 1940. The building was utilized as a smelting works and refinery and included eight furnaces. A 1931 advertisement for Columbia Smelting & Refining Works, Inc. of 98-106 Lorraine Street indicated that the company specialized in white metals and alloys and brass and bronze ingots. According to the advertisement, Columbia manufactured soft lead, antimonial lead, Babbitts, solder, type metals, terse metal, Britannia metal, die-cast metal, unbreakable metal and rerun zinc; consumed pig percentage metal, cable lead, battery plates, soft lead, type metals, Babbitts, joists, pewter and drosses; and dealt in pig tin, pig lead, copper, antimony, aluminum, spelter, scrap metals and residues. The facility building's address was 98-106 Lorraine Street, but historic maps also show the address range of 845-853 Hicks Street for the facility. A scrap iron facility and burlap tape manufacturer adjoined the smelter building to the south and east, respectively. Aside from these buildings, the Site block was undeveloped and appears to have been partially vegetated with grass and/or shrubs. In the 1930s, the Site vicinity (from Columbia to Court Streets and Mill to Halleck Streets) was reportedly occupied as a shanty town known as a Hooverville or Hoover City; historic photos show numerous shacks and piles of debris in these areas which are currently part of Red Hook Park.

Since demolition of the historic smelter building and the adjoining buildings in the late 1930s, the Site has been utilized as a park and/or ball field dating back to the early 1940s. NYC Parks' online inspection reports from May 2000 through February 2014 showed that the on-site athletic fields were rated as unacceptable because of lack of maintenance in January 2002, December 2003 and October 2005, and the lawns were unacceptable in May 2000. No further detail is provided.

The soil in the area of Red Hook where the Site is located is partially, if not entirely, composed of fill material rather than native soil. Historic maps of the Gowanus Canal area from the late 1700s through the early 1900s indicate that most of Red Hook was composed of low-lying wetlands, marshes and swamp areas. Historic Sanborn Fire Insurance maps and E. Belcher Hyde

Map Co. maps show that the original shoreline of the Gowanus Bay ran along the northwest portion of the property which is now the Red Hook Park, transitioning from the bay to native soil on the block where the former smelting facility was located, although the shorelines differ between the maps. The exact natural shoreline is unknown. The area was filled in by the early 1900s. The housing complex to the north of the Site was completed in 1939, and it may also contain fill material based on the historic presence of multiple dwellings and businesses prior to construction of the complex; if multiple buildings were razed during the same period, fill may have been utilized to level the ground in preparation for construction of the complex.

In early 2012, NYC Parks, in consultation with the New York City Department of Health and Mental Hygiene, collected soil samples from the ball fields on and surrounding the former smelting facility. The sampling was initially conducted to determine whether elevated lead levels were present at the fields, as a news article had reported. On February 28, 2012, NYC Parks collected seven soil samples from the block where the former smelter was located from zero to six inches below the ground surface (bgs), including three within the baseball/softball infields and four in the outfields. Two soil samples were also collected from an area within Red Hook Park two blocks east-southeast (and downwind) of the former smelter facility, near the artificial turf field, from zero to two inches bgs. Samples were analyzed for lead only. Results indicated the presence of lead above the applicable EPA and New York State screening level of 400 milligrams per kilogram (mg/kg) in seven of the nine samples, including six of the seven on the former smelter block. The highest lead detection was 2,080 mg/kg along Henry Street at the entrance to the ball fields. This area is known as the Henry Street Portal and is approximately 300 feet southeast (downwind) of the footprint of the former smelter facility. Lead in the outfields on this block was detected at 1,600 and 999 mg/kg.

Due to the elevated lead levels, NYC Parks closed the Henry Street Portal on February 28, 2012, and added one inch of infield material to each infield in late February/early March 2012 as part of its regular maintenance procedures. On March 15, 2012, NYC Parks collected composite samples of the newly-placed infield material from zero to two inches bgs in each of the four infields and confirmed that all lead levels in the infields were below 400 mg/kg. In addition, NYC Parks collected two discrete samples from Ball Field #6 on the southwest quadrant of the former smelter block, at 1.5 inches and two inches bgs, and detected lead at 2,140 and 2,630 mg/kg. NYC Parks then closed the entire block to the public by March 22, 2012 and completed hydroseeding of the outfields. The hydroseeding involved plug aeration where sparse grass cover was present, dressing the soil with one inch compost (via broadcasting) and brillion seeding of the treated area, in accordance with NYC Parks' protocol for densifying grass cover over lead-contaminated soil. The block remained closed for four to six weeks to allow grass growth. NYC Parks also added wood chips where bare soil was present, including the areas surrounding the bleachers along Lorraine Street. Near the intersection of Clinton and Court Streets, NYC Parks removed soil and added new clay in front of the bleachers at the artificial turf field.

NYC Parks also completed limited remediation where the highest lead level was detected, at the Henry Street Portal. In March 2012, an area of roughly 50 square feet (5 feet by 10 feet), where lead had been found at 2,080 mg/kg, was excavated. A concrete pad was installed to permanently cover the area. On March 20, 2012, a sample of the excavated material was

collected and analyzed for disposal characterization purposes. The sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and total metals (including mercury). There were no detections of VOCs or PCBs. There were several detections of SVOCs at levels below EPA's residential Removal Management Levels (RMLs), primarily polyaromatic hydrocarbons [i.e., benzo(a)pyrene, benzo(a)anthracene and benzo(b)fluoranthene]. Lead and mercury were found at concentrations of 812 and 0.63 mg/kg, respectively. On March 29, 2012, the excavated soil, contained in nine 55-gallon drums and totaling 4,500 pounds, was removed from the fields and shipped off-site for proper disposal. The waste manifest noted that the lead content in the soil was 0.08-0.2%. No further sampling has been conducted by NYC Parks, to date.

Site assessment activities/observations

EPA's Pre-remedial Site files, which included a Pre-Comprehensive Environmental Response, Compensation and Liability Information System Screening Form for the Site as well as historic city directories and Sanborn maps, were reviewed as part of this RSE. In addition, an internet search for historic articles, maps and photographs was conducted, and historic aerial photographs and online NYC Department of City Planning property records were reviewed. On July 1, 2014, RAB conducted an initial Site reconnaissance. Additional Site visits were conducted in fall and winter 2014. Exposed soil was observed at the Site near the bleacher areas between the fences and sidewalks. Some areas of the outfields had sparse grass cover. Exposed soil was also observed in tree lawns along Henry Street as well as in the picnic areas and soccer/football and baseball fields in Red Hook Park, south of Bay Street. The Red Hook East housing complex across Lorraine Street has large areas of grass-covered lawn, which are fenced in but accessible via open pedestrian gates leading to each area. Playgrounds within the Red Hook East Houses are paved and do not include grass or bare soil.

On October 15 and 16, 2014, the EPA SPB and RAB jointly conducted assessment sampling activities to determine whether operations at the former smelting facility resulted in a release of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) designated hazardous substances to the surrounding parkland and residential neighborhood at levels above EPA screening levels. Sixteen soil boring locations were selected in the vicinity of the Site, and a total of 82 grab soil samples were collected, including quality assurance/quality control samples. Samples were collected at the following five intervals in the upper two feet of soil within each boring: zero to one inch, one to six inches, six to 12 inches, 12 to 18 inches and 18 to 24 inches bgs. Approximate upwind and downwind sample locations were chosen using averaged annual wind rose charts from Manhattan and Brooklyn. Upwind locations, which served to document background conditions in the area, included three within the Red Hook East Houses to the northwest and north (S03, and S01/S02, respectively) as well as one outside the daycare center to the northwest (S04). Two additional locations were chosen in the Red Hook East Houses directly north of the Site (S15 and S16), within approximately 100 feet of the footprint of the former historic smelter. Four locations were included within or close to the former facility building's footprint (S05 through S08). Downwind locations were all within Red Hook Park and included four to the southeast along Henry Street (S09 through S12) and two to the southwest, in the picnic area along Bay Street (S13 and S14). All samples were analyzed for Target Analyte List metals and tin.

The analytical results indicate that lead is present at levels above the applicable EPA RML of 400 mg/kg at varying depths in all but two locations. RMLs are generic, chemical-specific concentrations for individual contaminants that may be used to support the decision for EPA to undertake a removal action. Although they are not necessarily health-protective concentrations in terms of chronic exposure, exceedance of an RML does not imply that adverse health effects will occur. The Superfund program treats parks as if they are residential properties with respect to the appropriate lead EPA RML of 400 mg/kg. A lead level of 1,200 mg/kg is also utilized for comparison within the Superfund Lead-Contaminated Residential Sites Handbook to describe an urgent threat or an acute risk. All sampling results were compared to the respective EPA RMLs as well as the NYSDEC Remedial Program Soil Cleanup Objectives (SCOs); the SCO for lead in residential and park settings is also 400 mg/kg. All sampling locations and the associated lead results exceeding the EPA RML by depth are depicted in Attachment A.

In the background locations northwest of the former smelting facility (S03 and S04), there was only one lead detection above the EPA RML, at 490 mg/kg in the deepest sampling interval within the Red Hook East Houses. There were no lead exceedances in front of the daycare center, which is also upwind of the former smelting facility. In the other two background locations within the Red Hook East Houses (S01 and S02), all lead detections at all depths equaled or exceeded 400 mg/kg, with the exception of one sample obtained from the one to six inch bgs interval. The highest lead level at these two locations (S01 and S02) was 4,800 mg/kg in the deepest interval, and all other elevated lead concentrations ranged from 400 to 1,200 mg/kg. The lead detections from zero to one inch bgs were 500 and 460 mg/kg at S01 and S02, respectively. In the remaining two locations within the Red Hook East Houses closest to the former smelting facility (S15 and S16), the only lead exceedances were in the lower foot of soil, slightly above the EPA RML, with detections at 650 and 670 mg/kg.

In the four sampling locations obtained from the area where the former facility was located as well as the four downwind locations along Henry Street (S05 through S12), the lead concentration exceeded the EPA RML at multiple intervals in every location. At the zero to one inch bgs interval, lead detections exceeded 400 mg/kg in seven of the eight locations, ranging from 560 to 980 mg/kg. Between one inch and one foot bgs, lead was present above the EPA RML in all eight locations, ranging from 770 to 5,700 mg/kg. Eleven of the 24 samples collected from the upper foot of soil contained lead above a concentration of 1,200 mg/kg. The lead concentrations generally increased with depth. In the two downwind samples to the southwest of the former smelting facility (S13 and S14), there were no elevated lead levels between zero and six inches bgs, but all samples collected between six inches and two feet bgs contained elevated lead detections. Detections above the EPA RML in this area ranged from 670 to 8,300 mg/kg.

In addition to the elevated lead detections, there were nine antimony detections, nine arsenic detections and seven iron detections that exceeded their respective EPA RMLs. None of these elevated contaminant levels were present at the zero to one inch bgs interval. Seven of the nine antimony detections and five of the nine arsenic detections were present either at the location of the former smelting facility or in the downwind sample locations along Henry Street. The nine elevated antimony detections ranged from 39 to 100 mg/kg, compared to the EPA RML of 31 mg/kg. The two antimony detections that were not obtained from the area of the former smelting

facility or along Henry Street were from samples obtained southwest of the former smelting facility (at S13 and S14), at depths in excess of 12 inches. The nine elevated arsenic detections ranged from 39 to 100 mg/kg, compared to the EPA RML of 34 mg/kg and the NYSDEC SCO of 16 mg/kg. The four arsenic detections that were not obtained from the area of the former smelting facility or downwind along Henry Street were from samples obtained north of the former smelting facility, in the NYCHA complex, at the deepest interval (110 mg/kg in SO2 and 65 mg/kg in S15) and southwest of the former facility at depths below six inches bgs (38 and 44 mg/kg in the six to 12 and 12 to 18 inch bgs intervals, respectively, in S14). The seven elevated iron detections ranged from 55,000 to 87,000 mg/kg, compared to the EPA RML of 55,000 mg/kg. Five of the seven elevated iron detections were obtained from the area of the former smelting facility and downwind of it; the other two were detected at the deepest intervals in locations north and southwest of the former facility (S02 and S13, respectively). No other metal detections exceeded EPA RMLs.

Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

Findings of the removal assessment field work indicate that there has been a release of CERCLA-designated hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), in several locations on and near the Site, which is a facility as defined under Section 101(9) of CERCLA.

It should be noted that because secondary smelter facilities typically only process a limited number of metals to generate specialized alloy products, rather than a wide variety of metals, it is characteristic for secondary lead smelter emissions to contain lead, antimony, tin and arsenic. Because the former smelting facility specialized in white metals and alloys, brass and bronze, it is likely that any emissions related to the former operations at that facility would also include the constituents of these metals: copper, zinc and tin.

A consistent pattern of elevated contaminant levels is present in the eight locations in the area where the former facility was situated and the area downwind of it to the southeast, along Henry Street, or sampling locations S05 through S12. Lead was detected at levels above 1,200 mg/kg in the upper foot of soil in all eight of these locations. At seven of these eight locations, lead was detected at levels above the EPA RML in every sampling interval within the upper foot of soil. The only location which did not contain elevated lead concentrations at all three intervals in the upper foot was location S06, where the surface lead detection did not exceed the EPA RML, but the lead detections from one to 12 inches bgs were above the EPA RML. This location is between the infield and a mound of stockpiled infield material, and it is possible that the infield material mixed with surface soil at this location during field maintenance. In addition to lead, the eight locations in the area of the former smelting facility and downwind along Henry Street also contained seven of the nine antimony detections above the EPA RML, five of the nine elevated arsenic detections above the EPA RML, four of the seven iron detections above the EPA RML, 18 of the 25 copper detections above the NYSDEC SCO, five of seven zinc detections above the NYSDEC SCO, and most of the highest tin concentrations (although no tin concentrations exceeded the applicable criteria). The areas downwind of the former historic smelter facility, including locations S09 through S12, were undeveloped before, during the time

and after the facility was operating. This history, in combination with the pattern of elevated lead levels in line with the predominant wind flow direction and the co-location of multiple contaminants characteristic of smelter emissions, suggests that a release of hazardous substances from the former facility to these locations has occurred. The depth intervals at which the contamination was detected are indicative of deposition from the former smelter facility after filling of the area by the early 1900s had already occurred.

The elevated contaminant levels a**t** the other sampling locations did not appear to demonstrate a strong pattern indicative of a release of hazardous substances from the former smelter operations to these areas. Within the Red Hook Houses (S01 through S03, S15 and S16), the majority of the elevated lead detections were only slightly above the EPA RML, and only one detection exceeded 1,200 mg/kg lead; this detection was at the deepest interval at location S02. There were only two detections of other contaminants above the EPA RML; they were arsenic and iron in the deepest interval at location S02. In the locations southwest of the former facility (S13 and S14), lead was detected at varying levels above the EPA RML but only from six to 24 inches bgs, and there was no pattern of elevated arsenic, antimony or iron detections. All of these contaminant detections did not demonstrate a pattern of contaminant levels in the upper foot of soil similar to the pattern found in the area of the former facility and downwind samples along Henry Street (S05 through S12). Because of the known historic filling of the Gowanus Bay in the area surrounding the Site by the early 1900s, as well as the extensive redevelopment of the land north of the former facility in the area of the housing complex, it is possible that these contaminants are present as a result of historic industrial fill and/or disturbance during the area's occupation as a Hooverville/Hoover City. In addition, academic studies conducted in Brooklyn have indicated that urban lead may be present in some areas at levels up to 3,492 ppm because of atmospheric deposition from various industrial plants, incinerators, from automobile exhaust and deteriorated lead-based paint, and it may be present up to 7,460 ppm in roadway grit possibly because of atmospheric deposition, deteriorating paint on elevated steel structures, the former use of leaded gasoline and vehicular wear products, and the current use of leaded wheel weights to balance tires.[a]

Because there was no apparent pattern of elevated contaminant detections at the locations to the northeast of the former smelting facility in the housing complex or to the southwest of the former smelting facility in the picnic area, and yet elevated contaminant levels are present, elemental correlation analysis was utilized to assess whether any of the elevated detections could be related the former smelter facility. This analysis determines whether contaminant detections are from a singular source, are characteristic of a release from the historic, former smelter facility or are a result of the presence of exogenous (i.e., non-native) fill material. The main premise of the analysis is that soil from the same parental material has similar elemental correlations which group together, whereas non-native fill material would show varying degrees of dissimilar elemental relationships and exhibit scattered, ungrouped distributions. The analysis was conducted for several groups of sampling locations: the north and northwest locations within the Red Hook Houses (S15/S16, and S03/S04, respectively), the northeast locations within the Red Hook Houses (S01 and S02), and the southwest locations (S13 and S14). In all of these groups of locations, the lead, antimony and tin detections were not correlated with each other; they did

[a] J. Caravanosa, et al. (2006). A survey of spatially distributed exterior dust lead loadings in New York City. *Environmental Research*, 100, 165-172.

not have similar elemental relationships as those present on-site and downwind along Henry Street. The varying ratios of other metals (such as aluminum, calcium, magnesium and manganese) within these samples indicate that the soil does not originate from the same source. Between individual sampling locations as well as between groups of locations, the soil composition varied considerably and did not exhibit any groupings. Therefore, the analysis indicates that at least the majority of the soil in these areas is exogenous fill, potentially from many different sources. As noted above, historic maps of the area support that it is likely fill material. Therefore, it does not appear that the elevated contaminant levels found to the north, northeast and southwest of the former smelter facility (locations S01 through S04 and S13 through S16) are due to a release from the historic on-site facility.

Elemental correlation analysis was also completed for the eight locations in the area of the former facility and downwind therefrom along Henry Street. The analysis indicated that there are strong correlations between lead and tin as well as lead and antimony, as would be expected from historic smelting emissions, in the locations both at the facility's former footprint (S05 through S08) and downwind along Henry Street (S09 through S12) within the upper 12 inches of soil. The ratios of various other metals (aluminum, calcium, magnesium and manganese) are not grouped for these eight locations, indicating that the soil does not originate from the same parent material, and therefore, it is exogenous fill. However, based on the similar, strong lead-antimony and lead-tin ratios present in the upper 12 inches at these locations and the pattern of these ratios at locations aligned with the historic facility footprint and the downwind areas, the elevated contaminant levels in these locations are indicative of a release from the former historic smelter, which occurred after the area was already developed with fill material.

Threats to Public Health or Welfare

There is a potential exposure to nearby populations from hazardous substances, pollutants or contaminants. The historic footprint of the smelter facility includes a baseball/softball field with soil that contains lead levels which exceed the EPA RML in almost every depth interval that was sampled, including surface soil. In the eight sampling locations near the historic facility and downwind near other ball fields, lead was present up to 5,700 mg/kg in the upper 12 inches of soil and up to 2,800 mg/kg from one to two feet bgs. Antimony, arsenic, and iron are also present in these locations above the respective EPA RMLs. Exposed soil was observed at the ball fields between July and December 2014, and online inspection reports indicated a lack of routine maintenance in the early 2000s; therefore, it is possible that grass cover is not consistently and adequately thick, and exposed soil may be periodically present in the outfields or other areas on this block. Plug aeration during annual maintenance may pull subsurface-contaminated bare soil to the surface and distribute it over the outfields and cricket courts. Bare soil is present in the bleacher areas and near the bus stop along Lorraine Street, which is also within the footprint of the former smelter facility.

Direct contact with the elevated levels of lead within the upper 12 inches of soil may occur through common recreational activities on the fields and when children touch or dig into contaminated soil. Hand washing facilities are not present in the immediate vicinity of the impacted ball fields. Contaminated soil may be ingested or adhere to baseball/softball cleats, other footwear, skin or clothing, and may be tracked off-site. In addition, through the typical

heavy usage of the athletic fields, contaminated soil may be disturbed and become airborne and available for inhalation.

Contact with the contaminated soil, or inhalation of contaminated soil particles, may present a health risk to those utilizing the recreational fields, particularly young children. The effects of exposure to lead are the same whether it enters the body through breathing or swallowing. The main target for lead toxicity is the nervous system, both in adults and children. Lead is a cumulative poison where increasing amounts can build up in the body, eventually reaching a point where symptoms and disability occur. Particularly sensitive populations are women of child-bearing age, because of the fetal transfer of lead, and children. Cognitive deficits are associated with fetal and childhood exposure to lead. An increase in blood pressure is the most sensitive, adverse health effect from lead exposure in adults.

The relationship between soil-lead concentrations and the consequent impact on blood levels in children has been studied through numerous epidemiological studies. Based on these epidemiological studies, it is generally believed that persistent exposure to soil-borne lead results in an increase in blood lead levels in children.

The Department of Health and Human Services has determined that lead and lead compounds are reasonably anticipated to be human carcinogens based on limited evidence from studies in humans and sufficient evidence from animal studies, and the EPA has determined that lead is a probable human carcinogen.

Threats to the Environment

At this time there is no information to indicate that the Site is currently having an acute impact to sensitive environments or natural resources near the Site.

Conclusions

The Columbia Smelting & Refining Works Site is a facility as defined under Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). Based on the available information, a release of CERCLA hazardous substances, as defined in Section 101(22) of CERCLA, 42 U.S.C. Section § 9601(22), has occurred at the Site in the areas near the historic smelter and downwind along Henry Street to the southeast. Lead, antimony, arsenic and iron exist in surface and/or subsurface soils in these areas at levels which exceed the respective EPA RMLs. Lead is present in these areas above 1,200 mg/kg in the upper foot of soil. There is a current exposure pathway existing that may present an imminent and substantial endangerment to the public health and welfare. A CERCLA removal action is warranted to mitigate the threat to public health or welfare posed by the presence of these contaminants at the Site. It is recommended that a CERCLA removal action be undertaken to address the uncontrolled release of these hazardous substances. Additional investigation should take place prior to initiation of the removal action to characterize the nature and extent of the release from the facility.

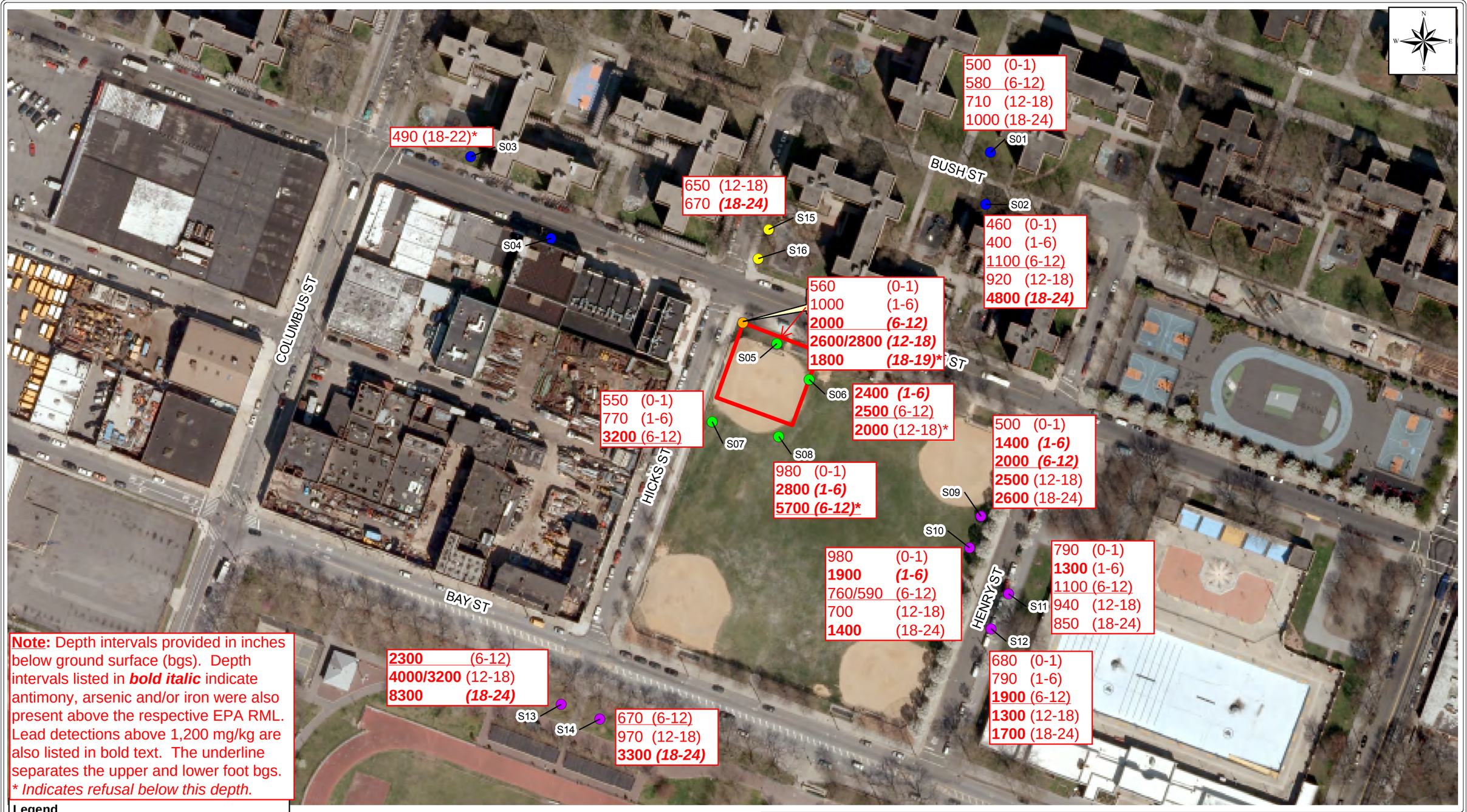
Despite the presence of CERCLA-designated hazardous substances in areas north, northeast and southwest of the historic smelter, the available information does not indicate that the former

facility is the source of a release of CERCLA-designated hazardous substances (as defined in section 101(14) of CERCLA, 42 U.S.C. § 9601) to these areas. A CERCLA removal action is not warranted in these areas. However, because of the presence of elevated contaminant levels in the picnic area southwest of the Site, EPA recommends that appropriate action be taken to mitigate the long-term threat of direct contact with the affected soil.

cc: E. Wilson, ERRD-RAB
A. Fessler, ERRD-SPB
B. Grealish, ERRD-RAB
EPA Region II Removal Records Center

ATTACHMENT A

Annotated Sampling Location Map with
Lead Levels Exceeding the EPA RML



Note: Depth intervals provided in inches below ground surface (bgs). Depth intervals listed in ***bold italic*** indicate antimony, arsenic and/or iron were also present above the respective EPA RML. Lead detections above 1,200 mg/kg are also listed in bold text. The underline separates the upper and lower foot bgs.
** Indicates refusal below this depth.*

Legend

- Background Sample Location
- Release Sample Location
- Site Sample Location
- Immediate Site Vicinity Sample Location
- Site Reference Location
- Approximate Footprint of the Former Smelter Facility

NOTE:
1. The property is noted as "Columbia Smelting & Refining Works Inc." on the 1938 Sanborn Map.
2. All location IDs preceded by "1411-".

SOURCES:
1. Environmental Data Resources (EDR), Sanborn Library Inc. Certified Sanborn Map, Volume 1, Sheets 27 and 28. 1938.
2. High Resolution Orthoimagery:2976484_20000180 and 2976484_20000185. U.S. Geological Survey (USGS). May 8th, 2009. http://earthexplorer.usgs.gov.

SCALE: 120 60 0 120 Graphic Scale In Feet

PROJECT: Columbia Smelting & Refining Works

CLIENT NAME: EPA

TITLE: Annotated Sample Location Map with Lead Levels Exceeding EPA RML in mg/kg
Columbia Smelting & Refining Works
98 Lorraine Street, Brooklyn, NY

WESTON SOLUTIONS SM

DATE: October 2014

FIGURE #: 3

P:/SAT2/2014_Smelters_Sites/ColumbiaSmelting/MXD/15582_CSRW_Prop_Loc.mxd